FOREIGN SERVICE

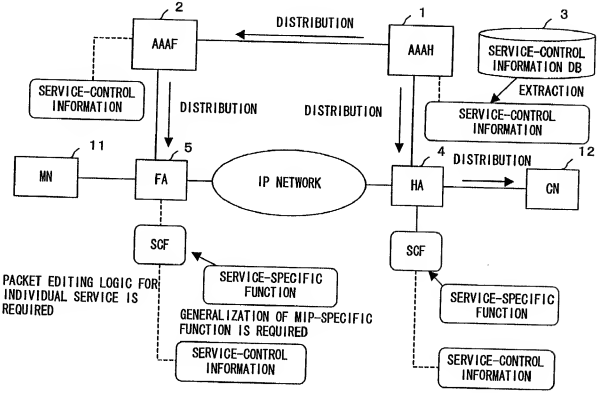


FIG. 1

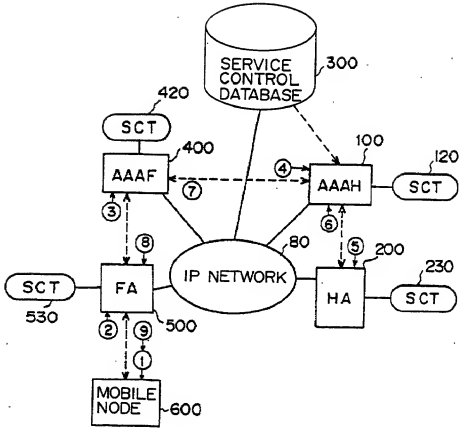

SERVICE CONTROL DATABASE
300
420
SCT
400
AAAF
100
AAAH
120
SCT
4
7
3
6
8
5
200
80
IP NETWORK
230
SCT
FA
HA
SCT
530
2
9
500
1
MOBILE NODE
600

FIG. 2

PATENT SPECIFICATION

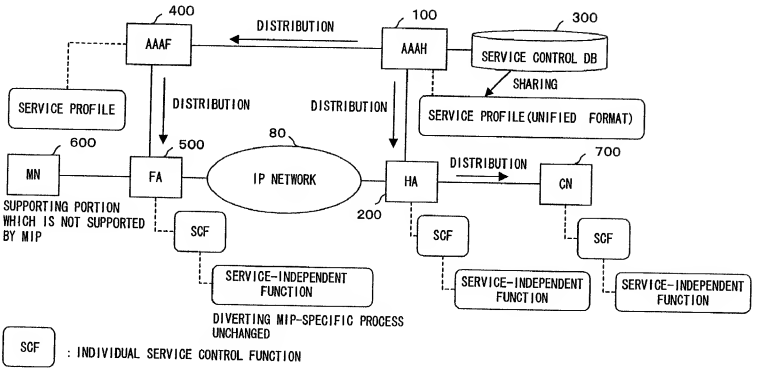


FIG. 3

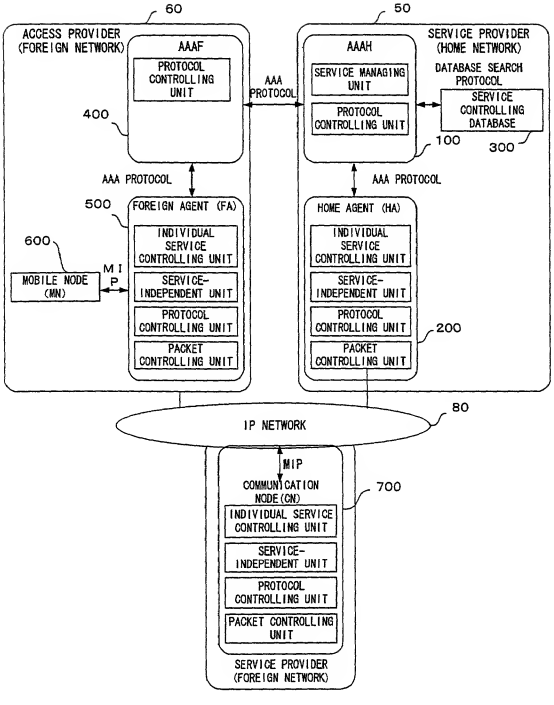

60
50
ACCESS PROVIDER
(FOREIGN NETWORK)
AAAF
PROTOCOL
CONTROLLING
UNIT
400
AAA
PROTOCOL
SERVICE PROVIDER
(HOME NETWORK)
AAAH
SERVICE MANAGING
UNIT
PROTOCOL
CONTROLLING UNIT
DATABASE SEARCH
PROTOCOL
SERVICE
CONTROLLING
DATABASE
100
300
AAA PROTOCOL
AAA PROTOCOL
500
FOREIGN AGENT (FA)
HOME AGENT (HA)
600
MOBILE NODE
(MN)
MI
P
INDIVIDUAL
SERVICE
CONTROLLING UNIT
SERVICE-
INDEPENDENT UNIT
PROTOCOL
CONTROLLING UNIT
PACKET
CONTROLLING UNIT
200
80
IP NETWORK
MIP
COMMUNICATION
NODE(CN)
700
INDIVIDUAL SERVICE
CONTROLLING UNIT
SERVICE-
INDEPENDENT UNIT
PROTOCOL
CONTROLLING UNIT
PACKET CONTROLLING
UNIT
SERVICE PROVIDER
(FOREIGN NETWORK)

FIG. 4

PRIOR ART

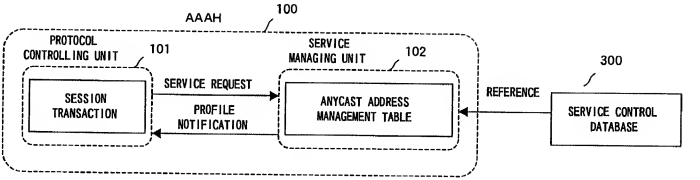


FIG. 5

CONSTITUENT ELEMENT	CONTENTS
NAI	USER NAI (NETWORK ACSESS IDENFIFIER)
USER PROFILE	USER NAME, ADDRESS, TELEPHONE NO., ETC.
USER AUTHENTICATION INFORMATION	MN-AAA AUTHENTICATION KEY/USER ID/PASSWORD
SLA (SERVICE LEVEL AGREEMENT))	CONTRACT CONDITION OF SUBSCRIBER
PROFILE FOR INDIVIDUAL SERVICE	PROFILE INFORMATION ABOUT INDIVIDUAL SERVICE SUCH AS DIFF-SERVE, PACKET FILTERING, ANYCAST, MULTICAST, ETC.

FIG. 6

PUBLISHED

SERVICE CLASS	CONTENTS
CLASS A	GUARANTEEING THAT TRANSMISSION DELAY IS WITHIN ALLOWABLE RANGE.
CLASS B	ADDING TO QUEUE WITH HIGH PRECEDENCE WITHIN RANGE WHERE CLASS A IS NOT INFLUENCED BY Diff-Serv. THIS CLASS MAY BE DIVIDED INTO SEVERAL CLASSES.
CLASS C	BEST EFFORT. ADDING TO QUEUE WITH LOWER PRECEDENCE THAN CLASS B.

FIG. 7

PATENT SPECIFICATION

ACCOUNTING METHOD	CONTENTS
FIXED CHARGE (FLAT RATE FOR FIXED TIME. EXTRA CHARGE FOR EXCEEDING TIME)	BASIC CHARGE WEIGHTED IN CORRESPONDENCE WITH SERVICE CLASS + UNIT TIME CHARGE WEIGHTED IN CORRESPONDENCE WITH SERVICE CLASS x EXCEEDING TIME
PACKET-QUANTITY-BASED CHARGE	Σ (UNIT CHARGE WEIGHTED IN CORRESPONDENCE WITH SERVICE CLASS x TOTAL QUANTITY OF UPSTREAM AND DOWNSTREAM PACKETS OF EDGE NODE (FA))

FIG. 8

PUBLISHED

RESTRICTION CONDITION	CONTENTS
AMOUNT OF MONEY	IF CHARGE EXCEEDS AMOUNT OF MONEY SPECIFIED BY USER, WARNING IS ISSUED TO USER, WHO IS MADE TO SELECT WHETHER TO CONTINUE COMMUNICATION
TIME	ACCESS WITHIN TIME PERIOD DURING WHICH COMMUNICATION TRAFFIC VOLUME IS HEAVY ARE PROHIBITED, SO THAT CHEARPER ACCOUNTING SERVICE IS PROVIDED CHANGING A SERVICE CLASS DEPENDING ON THE TIME OF DAY
SERVICE CLASS CHANGE DEPENDING ON PACKET TYPE	TOTAL AMOUNT OF MONEY OF PACKET-UANTITY-BASED CHARGE IS HELD DOWN BY SPECIFYING SERVICE CLASS ACCORDING TO APPLICTION TYPE
ROAMING	EXTRA CHARGE DUE TO PERMISSION OF ROAMING SERVICE OR CHARGE DISCOUNT DUE TO PROHIBITION OF ROAMING SERVICE

FIG. 9

FOR OFFICIAL USE ONLY

SERVICE TYPE		Diff-Serv
ADDITIONAL INFORMATION (MULTIPLE ITEMS PERMITTED)	Diff-Serv APPLICATION POLICY	CONDITIONAL EXPRESSION (SIMILAR TO POLICY DESCRIPTION LANGUAGE)
	SERVICE APPLIED CLASS	CLASS A CLASS B CLASS C
	IDENTIFICATION BETWEEN UPSTREAM AND DOWNSTREAM	UPSTREAM: PACKET TRANSMITTING FROM MN DOWNSTREAM: PACKET RECEIVING BY MN
	IP ADDRESS	TRANSMISSION SOURCE ADDRESS WHEN BEING SPECIFIED BY CONDITIONAL EXPRESSION
	PORT NUMBER	TRANSMISSION SOURCE PORT NUMBER WHEN BEING SPECIFIED BY CONDITIONAL EXPRESSION

FIG. 10

PATENT SERVICES

SERVICE TYPE		ANYCAST
ADDITIONAL INFORMATION	ADDRESS SELECTION POLICY	CONDITIONAL EXPRESSION (SIMILAR TO POLICY DESCRIPTION LANGUAGE)
	ANYCAST ADDRESS	ADDRESS TO WHICH ANYCAST SERVICE IS APPLIED

FIG. 11

CONFIGURATION RESULT	DETAILED CONFIGURATION INFORMATION	DESCRIPTION
PROFILE IDENTIFIER	SESSION IDENTIFIER	SESSION ID
	PROFILE NUMBER	VALUE UNIQUELY ASSIGNED TO EACH SESSION
TARGET PACKET CONTROL INFORMATION	SOURCE ADDRESS	PACKET TRANSMISSION SOURCE ADDRESS
	SOURCE PORT NUMBER	PACKET TRANSMISSION SOURCE PORT NUMBER
	DESTINATION ADDRESS	PACKET RECEPTION DESTINATION ADDRESS
	DESTINATION PORT NUMBER	PACKET RECEPTION DESTINATION PORT NUMBER
ROUTING/PACKET EDITING INFORMATION	ENCAPSULATION (ENCRYPTION) METHOD	TRANSFER PACKET ENCAPSULATION METHOD
	TRANSFER DESTINATION ADDRESS (MULTIPLE ADDRESSES SPECIFIABLE)	PACKET TRANSFER DESTINATION ADDRESS
	TOS	TOS VALUE ASSIGNED TO PACKET
	DECAPSULATION INSTRUCTION	DECAPSULATION REQUEST
INDIVIDUAL CONTROL INFORMATION	SERVICE CONTROL TYPE	CONTROL TABLE TO BE SEARCHED NEXT SERVICE PROFILE CACHE BINDING CACHE MIP HOME (MOBILITY BINDING) MIP FOREIGN (VISITOR LIST) ANYCAST TABLE (EXTENDED VISITOR LIST) ROUTING TABLE.
	CONTROL INFORMATION IDENTIFIER	REFERENCE IDENTIFIER OF INDIVIDUAL CONTROL TALBLE

FIG. 12

ANYCAST ADDRESS		
NAI	HOME ADDRESS	TERMINAL STATE
:	:	:

FIG. 13

CONSTITUENT ELEMENT	DESCRIPTION
SESSION ID	NAI OF MAN/32-BIT VALUE/OPTION
HA ADDRESS	HA ADDRESS SPECIFIED BY AAAH
ADDRESS OF AAAF SPCIFYING HA	ADDRESS OF AAAF THAT AAAH REQUESTS TO SPECIFY HA
CURRENT AAAF ADDRESS	ADDRESS OF AAAF WHICH REQUESTS AMR
SECURITY INFORMATION	INFORMATION FOR AUTHENTICATING RELATIONSHIP BETWEEN HA AND AAAF
SESSION TIMER	VALID TIME PERIOD OF THIS TRANSACTION
FA SERVICE PROFILE	SEE FIG. 12
HA SERVICE PROFILE	SEE FIG. 12

FIG. 14

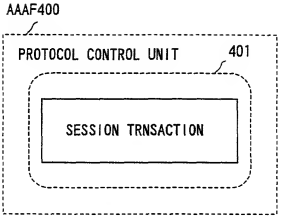


FIG. 15

CONSTITUENT ELEMENT	DESCRIPTION
SESSION ID	<NAI OF MN><32-BIT VALUE><OPTION>
AAAH ADDRESS	AAAH ADDRESS IDENTIFIED BY NAI OF MN
HA ADDRESS	HA ADDRESS SPECIFIED BY AAAF
PREVIOUS FA-NAI	NAI OF PREVIOUS FA WHEN MN MOVES TO NEW FA
CURRENT FA-NAI	NAI OF FA TO WHICH MN IS CURRENTLY CONNECTING
SECURITY INFORMATION	INFORMATION FOR AUTHENTICATING RELATIONSHIP BETWEEN FA, AAAH, AND HA (WHEN BEING SPECIFIED BY AAAF)
SESSION TIMER	VALID TIME PERIOD OF THIS TRANSACTION
FA SERVICE PROFILE	SEE FIG. 12
HA SERVICE PROFILE	SEE FIG. 12
STATE	WAITING TO BE PROCESSED, HA IS BEING REQUESTED, AMA IS BEING PROCESSED

FIG. 16

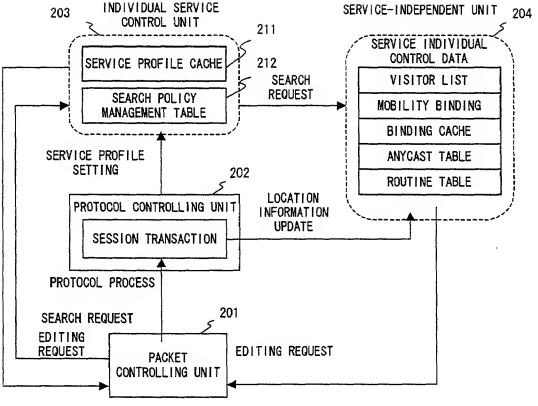

203
INDIVIDUAL SERVICE CONTROL UNIT
211
SERVICE PROFILE CACHE
212
SEARCH POLICY MANAGEMENT TABLE
SEARCH REQUEST
SERVICE-INDEPENDENT UNIT
204
SERVICE INDIVIDUAL CONTROL DATA
VISITOR LIST
MOBILITY BINDING
BINDING CACHE
ANYCAST TABLE
ROUTINE TABLE
SERVICE PROFILE SETTING
202
PROTOCOL CONTROLLING UNIT
SESSION TRANSACTION
LOCATION INFORMATION UPDATE
PROTOCOL PROCESS
SEARCH REQUEST
201
EDITING REQUEST
PACKET CONTROLLING UNIT
EDITING REQUEST

FIG. 17

CONSTITUENT ELEMENT	DESCRIPTION
SESSION ID	〈NAI OF MN〉〈32-BIT〉〈OPTION〉
SESSION TIMER	VALID TIME PERIOD OF THIS TRANSACTION

FIG. 18

EPO - DG 1

SERVICE PROFILE CACHE			DESCRIPTION
SPC	INDIVIDUAL NODE SPC (NSPC)	SOURCE SPC (NSPCsrc)	SERVICE PROFILES SET FOR WHICH SOURCE INFORMATION OF DATA PACKET GENERATED BY MOBILE NODE FROM STATIC INFORMATION STORED ONTO HD, ETC. OF NETWORK DEVICE AT THE TIME OF INITIAL CONFIGURATION IS USED AS SEARCH CONDITION. MAINLY USED TO PERFORM USER-INDEPENDENT COMMON SERVICE CONTROL
		SOURCE DEFAULT SP (NDSPsrc)	SERVICE PROFILE APPLIED WHEN THERE IS MATCH OF ANY OF SERVICE PROFILES IN NSPCsrc, AND NO MATCH IN INDIVIDUAL CONTROL TABLE
		DESTINATION SPC (NSPCdst)	SERVICE PROFILE SET FOR WHICH DESTINATION INFORMATION OF DATA PACKET GENERATED BY MOBILE AGENT FROM STATIC INFORMATION STORED ONTO HD, ETC. OF NETWORK DEVICE AT THE TIME OF INITIAL CONFIGURATION IS USED AS SEARCH CONDITION MAINLY USED TO PERFORM USER-INDEPENDENT COMMON SERVICE CONTROL
		DESTINATION DEFAULT SP (NDSPdst)	SERVICE PROFILE APPLIED WHEN THERE IS MATCH OF ANY OF SERVICE PROFILES IN NSPCdsp, AND NO MATCH IN INDIVIDUAL CONTROL TABLE
		DEFAULT SP (NDSP)	SERVICE PROFILE FOR SEARCHING CONTROL TABLE SPECIFIC TO NETWORK DEVICE WHEN THERE IS NO MATCH OF ANY SERVICE PROFILES
	AAA-NOTIFIED SPC(ASPC)	SOURCE SPC (ASPCsrc)	USER-SPECIFIC SERVICE PROFILE SET FOR WHICH SOURCE INFORMATION OF DATA PACKET NOTIFIED FROM AAA SYSTEM WHEN MN LOGS IN NETWORK IS USED AS SEARCH CONDITION
		DESTINATION SPC (ASPCdst)	USER-SPECIFIC SERVICE PROFILE SET FOR WHICH DESTINATION INFORMATION OF DATA PACKET NOTIFIED FROM AAA SYSTEM WHEN MN LOGS IN NETWORK IS USED AS SEARCH CONDITION

FIG. 19

PROCEDUAL STEP	CACHE SEARCHED	CACHE SEARCH RESULT	INDIVIDUAL CONTROL DATA SEARCH RESULT	NEXT SEARCH PROCESS
1	ASPCsrc	MATCH	MATCH	NORMAL END
			MISMATCH	ABNORMAL END
		MISMATCH		NSPCsrc SEARCH
2	NSPCsrc	MATCH	MATCH	NORMAL END
			MISMATCH	NDSPsrc REFERENCE
		MISMATCH		ASPCdst SEARCH
3	ASPCdst	MATCH	MATCH	NORMAL END
			MISMATCH	ABNORMAL END
		MISMATCH		NSPCdst SEARCH
4	NSPCdst	MATCH	MATCH	NORMAL END
			MISMATCH	NSPCdst SEARCH
		MISMATCH		NDSP REFERENCE
5	NDSP	MATCH	MATCH	NORMAL END
			MISMATCH	ABNORMAL END

FIG. 20

CONSTITUENT ELEMENT	DESCRIPTION
IP TRANSMISSION SOURCE ADDRESS (HOME ADDRESS)	MN HOME ADDRESS NOTIFIED BY REGISTRATION REQUEST OR AMA
MN LINK LAYER SOURCE ADDRESS	LINK LAYER (MAC) ADDRESS OF MN
UDP TRANSMISSION SOURCE PORT	UDP SOURCE PORT OF MN
HOME AGENT ADDRESS	ADDRESS OF HA WHICH FORWARDS REGISTRATION REQUEST. NOTIFIED BY REGISTRATION REQUEST OR AMA
REGISTRATION REQUEST IDENTIFIER FIELD	IDENTIFIER FOR MAKING CORRESPONDENCE BETWEEN REQUEST AND REPLY
LIFETIME	VALID TIME PERIOD OF REGISTRATION REQUEST
AUTHENTICATION INFORMATION	AUTHENTICATION INFORMATION ACCORDING TO WHICH FA AUTHENTICATES MN

FIG. 21

SUBSTITUTE SHEET (RULE 26)

CONSTITUENT ELEMENT	DESCRIPTION
HOME ADDRESS	HOME ADDRESS ASSIGNED TO MN
CARE-OF ADDRESS OF MOBILE NODE	IP ADDRESS OF FA TO WHICH MN IS CURRENTLY CONNECTED
IDENTIFIER FILED OF REGISTRATION REQUEST	IDENTIFIER FOR MAKING CORRESPONDENCE BETWEEN REQUEST AND REPLY
LIFETIME	VALID TIME PERIOD OF REGISTRATION REQUEST
AUTHENTICATION INFORMATION	INFORMATION ACCORDING TO WHICH FA AUTHENTICATES MN

FIG. 22

SOURCE ADDRESS	SOURCE PORT	DESTINATION ADDRESS	DESTINATION PORT	ENCAPSULATION	CARE-OF ADDRESS	TOS
111. 100. 100. 101	.	222. 200. 100. 123	.	x x	333. 300. 100. 0	XX
		222. 200. 100. 133		x x	333. 300. 100. 0	YY

FIG. 23

CONSTITUENT ELEMENT	DESCRIPTION
IP PROXY ADDRESS	HOME ADDRESS OF MN
IP SOURCE ADDRESS	ANYCAST ADDRESS
LINK LAYER SOURCE ADDRESS	MAC ADDRESS OF MN
UDP SOURCE PORT	UDP SOURCE PORT OF MN
HOME AGENT ADDRESS	ADDRESS OF HOME AGENT HAVING HOME ADDRESS OF MN
ADDRESS PROXY ADDRESS	ADDRESS OF ADDRESS PROXY HAVING ANYCAST ADDRESS
IDENTIFIER FIELD OF REGISTRATION REQUEST	IDENTIFIER FOR MAKING CORRESPONDENCE BETWEEN REQUEST AND REPLY
LIFETIME	REGISTRATION TIME PERIOD

FIG. 24

DESTINATION ADDRESS	NEXT HOP ADDRESS
111. *. *. *	111. 100. 100. 0
222. *. *. *	222. 200. 200. 0
333. *. *. *	333. 300. 300. 0

FIG. 25

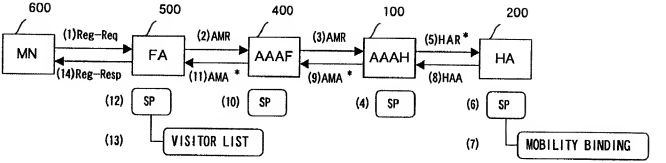

600
500
400
100
200
MN
FA
AAAF
AAAH
HA
(1)Reg-Req
(14)Reg-Resp
(2)AMR
(11)AMA *
(3)AMR
(9)AMA *
(5)HAR *
(8)HAA
(12) SP
(10) SP
(4) SP
(6) SP
(13)
VISITOR LIST
(7)
MOBILITY BINDING

FIG. 26

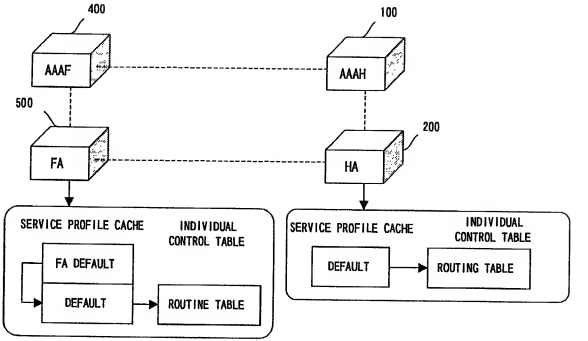

400
100
AAAF
AAAH
500
200
FA
HA
SERVICE PROFILE CACHE
INDIVIDUAL CONTROL TABLE
FA DEFAULT
DEFAULT
ROUTINE TABLE
SERVICE PROFILE CACHE
INDIVIDUAL CONTROL TABLE
DEFAULT
ROUTING TABLE

FIG. 27

FIG. 28A

CONSTITUENT INFORMATION	DETAILED CONFIGURATION INFORMATION	SET VALUE
TARGET PACKET CONTROL INFORMATION	SOURCE ADDRESS	*
	SOURCE PORT NUMBER	*
	DESTINATION ADDRESS	*
	DESTINATION PORT NUMBER	*
ROUTINE/PACKET EDITING INFORMATION	ENCAPSULATION (ENCRYPTION) METHOD	*
	TRANSFER DESTINATION ADDRESS (MULTIPLE ADDRESSES SPECIFIABLE)	*
	TOS	*
	DECAPSULATION INSTRUCTION	NOT GIVEN
INDIVIDUAL CONTROL INFORMATION	NEST SERVICE CONTROL TYPE	ROUTING TABLE

FIG. 28B

CONSTITUENT INFORMATION	DETAILED CONFIGURATION INFORMATION	SET VALUE
TARGET PACKET CONTROL INFORMATION	SOURCE ADDRESS	*
	SOURCE PORT NUMBER	*
	DESTINATION ADDRESS	IP ADDRESS OF FA (CARE-OF ADDRESS)
	DESTINATION PORT NUMBER	*
ROUTINE/PACKET EDITING INFORMATION	ENCAPSULATION (ENCRYPTION) METHOD	*
	TRANSFER DESTINATION ADDRESS (MULTIPLE ADDRESSES SPECIFIABLE)	*
	TOS	*
	DECAPSULATION INSTRUCTION	GIVEN
INDIVIDUAL CONTROL INFORMATION	NEST SERVICE CONTROL TYPE	SERVICE PROFILE CACHE

CONSTITUENT INFORMATION	DETAILED CONFIGURATION INFORMATION	SET VALUE
TARGET PACKET CONTROL INFORMATION	SOURCE ADDRESS	*
	SOURCE PORT NUMBER	*
	DESTINATION ADDRESS	*
	DESTINATION PORT NUMBER	*
ROUTING/PACKET EDITING INFORMATION	ENCAPSULATION (ENCRYPTION) METHOD	*
	TRANSFER DESTINATION ADDRESS (MULTIPLE ADDRESSES SPECIFIABLE)	*
	TOS	*
	DECAPSULATION INSTRUCTION	NOT GIVEN
INDIVIDUAL CONTROL INFORMATION	NEXT SERVICE CONTROL TYPE	ROUTING TABLE

FIG. 29

PATENT SERVICES

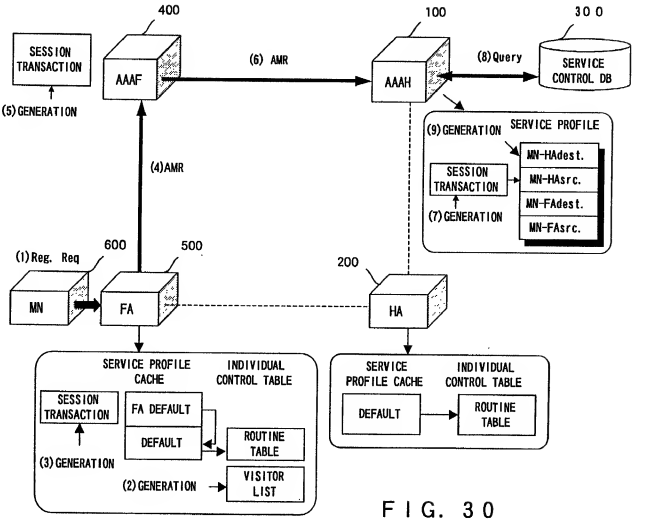


FIG. 30

FIG. 31A

CONFIGURATION INFORMATION	DETAILED CONFIGURATION INFORMATION	SET VALUE
TARGET PACKET CONTROL INFORMATION	SOURCE ADDRESS	*
	SOURCE PORT NUMBER	*
	DESTINATION ADDRESS	HOME ADDRESS OF MN
	DESTINATION PORT NUMBER	PORT NUMBER OF MN (OPTION)
ROUTINE/PACKET EDITING INFORMATION	ENCAPSULATION (ENCRYPTION) METHOD	*
	TRANSFER DESTINATION ADDRESS (MULTIPLE ADDRESSES SPECIFIABLE)	*
	TOS	SPECIFIED AT THE TIME OF Diff-Serv EXECUTION
	DECAPSULATION INSTRUCTION	NOT GIVEN
INDIVIDUAL CONTROL INFORMATION	NEXT SERVICE CONTROL TYPE	MOBILITY BINDING

FIG. 31B

CONFIGURATION INFORMATION	DETAILED CONFIGURATION INFORMATION	SET VALUE
TARGET PACKET CONTROL INFORMATION	TRANSMISSION SOURCE ADDRESS	HOME ADDRESS OF CN
	TRANSMISSION SOURCE PORT NUMBER	PORT NUMBER OF CN (OPTION)
	RECEPTION DESTINATION ADDRESS	*
	RECEPTION DESTINATION PORT NUMBER	*
ROUTINE/PACKET EDITING INFORMATION	ENCAPSULATION (ENCRYPTION) METHOD	*
	TRANSFER DESTINATION ADDRESS (MULTIPLE ADDRESSES SPECIFIABLE)	"0" IS SPECIFIED AT THE TIME OF PACKET FILTERING
	TOS	*
	DECAPSULATION INSTRUCTION	NOT GIVEN
INDIVIDUAL CONTROL INFORMATION	NEXT SERVICE CONTROL TYPE	*

FIG. 32A

CONFIGURATION INFORMATION	DETAILED CONFIGURATION INFORMATION	SET VALUE
TARGET PACKET CONTROL INFORMATION	SOURCE ADDRESS	*
	SOURCE PORT NUMBER	*
	DESTINATION ADDRESS	HOME ADDRESS OF MN
	DESTINATION PORT NUMBER	PORT NUMBER OF MN (OPTION)
ROUTINE/PACKET EDITING INFORMATION	ENCAPSULATION (ENCRYPTION) METHOD	*
	TRANSFER DESTINATION ADDRESS (MULTIPLE ADDRESSES SPECIFIABLE)	*
	TOS	*
	DECAPSULATION INSTRUCTION	NOT GIVEN
INDIVIDUAL CONTROL INFORMATION	NEXT SERVICE CONTROL TYPE	VISITOR LIST

FIG. 32B

CONFIGURATION INFORMATION	DETAILED CONFIRMATION INFORMATION	SET VALUE
TARGET PACKET CONTROL INFORMATION	SOURCE ADDRESS	HOME ADDRESS OF MN
	SOURCE PORT NUMBER	PORT NUMBER OF MN (OPTION)
	DESTINATION ADDRESS	*
	DESTINATION PORT NUMBER	*
ROUTINE/PACKET EDITING INFORMATION	ENCAPSULATION (ENCRYPTION) METHOD	*
	TRANSFER DESTINATION ADDRESS (MULTIPLE ADDRESSES SPECIFIABLE)	*
	TOS	SPECIFIED AT THE TIME OF Diff-Serv EXECUTION (OPTION)
	DECAPSULATION INSTRUCTION	NOT GIVEN
INDIVIDUAL CONTROL INFORMATION	NEXT SERVICE CONTROL TYPE	ROUTING TABLE

FOREIGN SERVICE

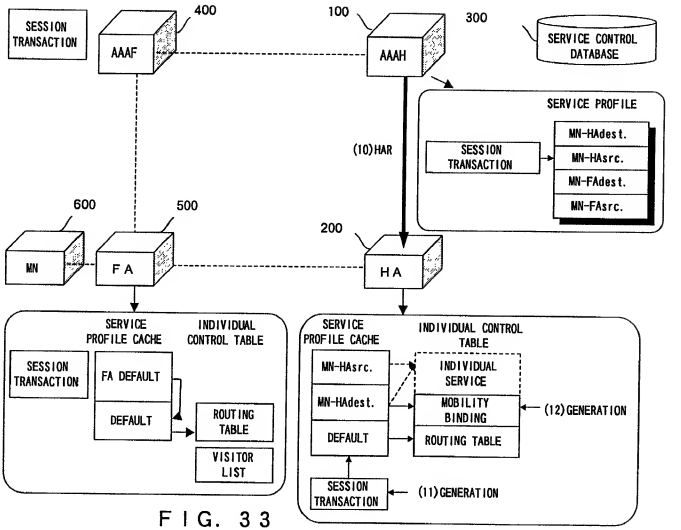


FIG. 33

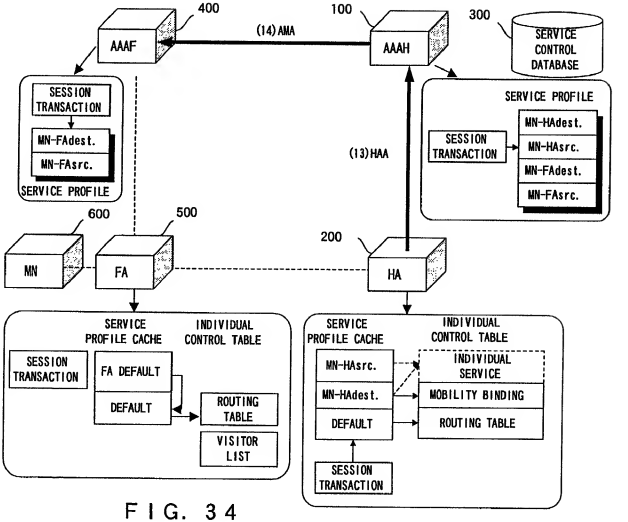

400
AAAF
(14) AMA
100
AAAH
300
SERVICE CONTROL DATABASE
SESSION TRANSACTION
MN-FAdest.
MN-FAsrc.
SERVICE PROFILE
(13) HAA
SERVICE PROFILE
SESSION TRANSACTION
MN-HAdest.
MN-HAsrc.
MN-FAdest.
MN-FAsrc.
600
500
200
MN
FA
HA
SERVICE PROFILE CACHE
INDIVIDUAL CONTROL TABLE
SESSION TRANSACTION
FA DEFAULT
DEFAULT
ROUTING TABLE
VISITOR LIST
SERVICE PROFILE CACHE
INDIVIDUAL CONTROL TABLE
MN-HAsrc.
MN-HAdest.
DEFAULT
INDIVIDUAL SERVICE
MOBILITY BINDING
ROUTING TABLE
SESSION TRANSACTION

FIG. 34

PUBLISHED SPECIFICATION

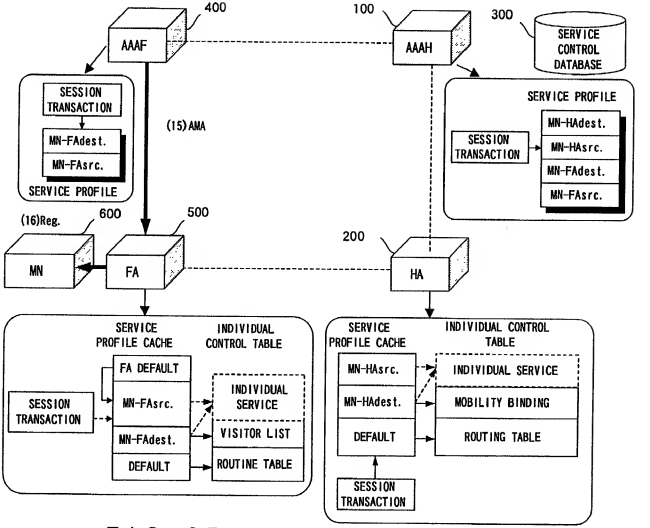


FIG. 35

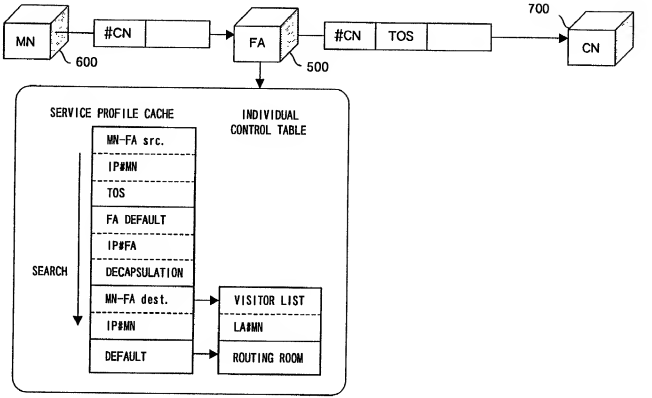

MN
600
#CN
FA
500
#CN
TOS
700
CN
SERVICE PROFILE CACHE
INDIVIDUAL CONTROL TABLE
MN-FA src.
IP#MN
TOS
FA DEFAULT
IP#FA
DECAPSULATION
MN-FA dest.
IP#MN
DEFAULT
SEARCH
VISITOR LIST
LA#MN
ROUTING ROOM

FIG. 36

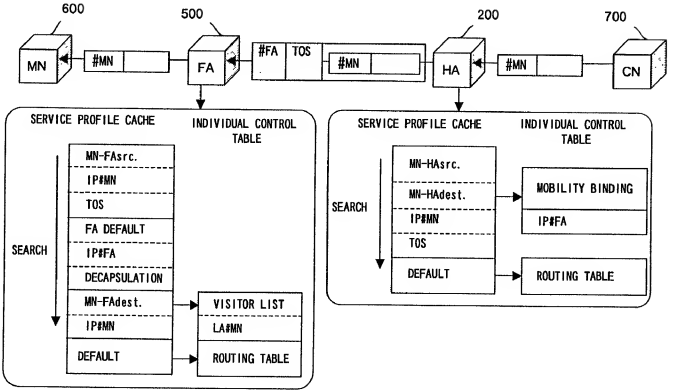

600
500
200
700
MN
#MN
FA
#FA
TOS
#MN
HA
#MN
CN
SERVICE PROFILE CACHE
INDIVIDUAL CONTROL TABLE
SEARCH
MN-FAsrc.
IP#MN
TOS
FA DEFAULT
IP#FA
DECAPSULATION
MN-FAdest.
IP#MN
DEFAULT
VISITOR LIST
LA#MN
ROUTING TABLE
SERVICE PROFILE CACHE
INDIVIDUAL CONTROL TABLE
SEARCH
MN-HAsrc.
MN-HAdest.
IP#MN
TOS
DEFAULT
MOBILITY BINDING
IP#FA
ROUTING TABLE

FIG. 37

PCT/JP2003/000000

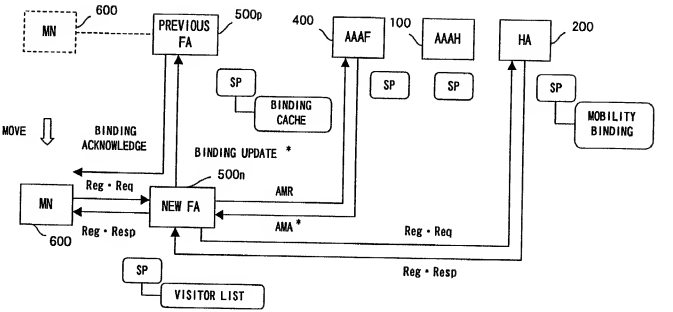


FIG. 38

PUBLISHED DOCUMENT

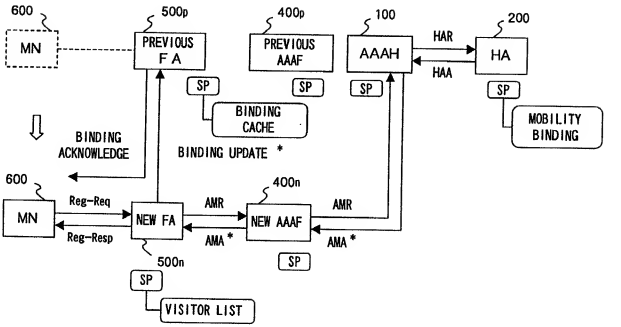


FIG. 39

FOREIGN SERVICES

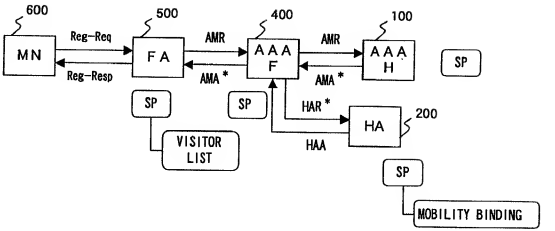


FIG. 40

PRIOR ART

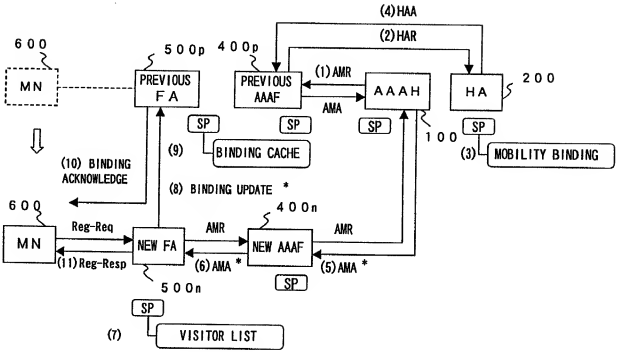


FIG. 41

UNITED STATES PATENT

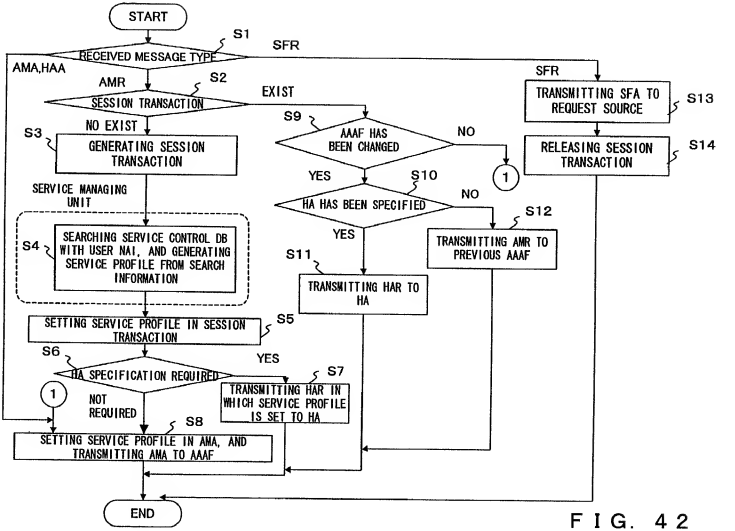


FIG. 42

FOR OFFICIAL USE ONLY

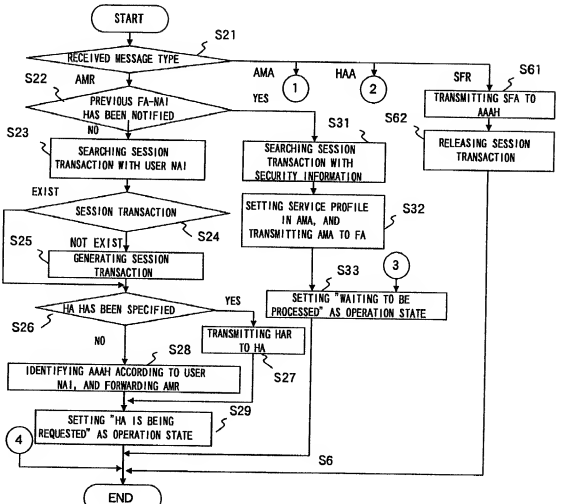


FIG. 43

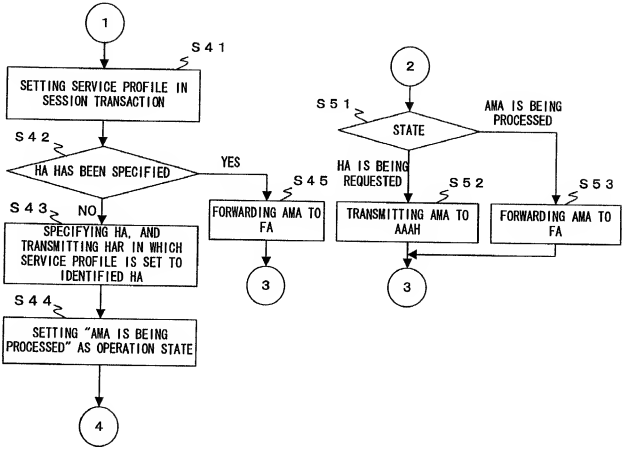

1
S41
SETTING SERVICE PROFILE IN SESSION TRANSACTION
S42
HA HAS BEEN SPECIFIED
YES
S45
FORWARDING AMA TO FA
3
S43
NO
SPECIFYING HA, AND TRANSMITTING HAR IN WHICH SERVICE PROFILE IS SET TO IDENTIFIED HA
S44
SETTING "AMA IS BEING PROCESSED" AS OPERATION STATE
4
2
S51
STATE
AMA IS BEING PROCESSED
HA IS BEING REQUESTED
S52
TRANSMITTING AMA TO AAAH
S53
FORWARDING AMA TO FA
3

FIG. 44

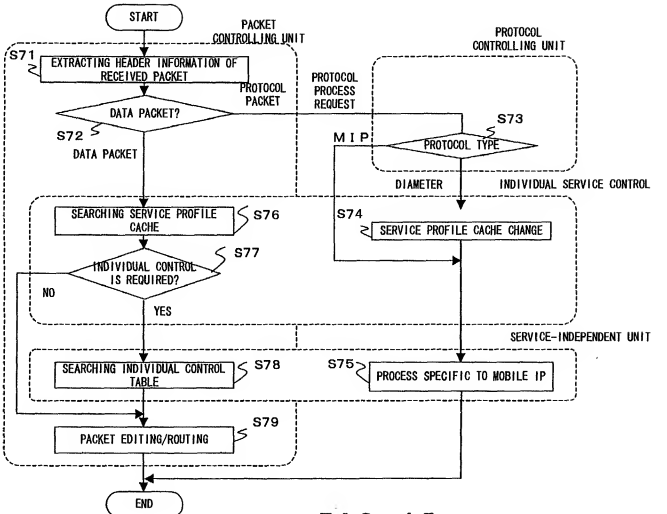

START
PACKET CONTROLLING UNIT
PROTOCOL CONTROLLING UNIT
S71
EXTRACTING HEADER INFORMATION OF RECEIVED PACKET
PROTOCOL PACKET
PROTOCOL PROCESS REQUEST
DATA PACKET?
S72
DATA PACKET
S73
MIP
PROTOCOL TYPE
DIAMETER
INDIVIDUAL SERVICE CONTROL
SEARCHING SERVICE PROFILE CACHE
S76
S74
SERVICE PROFILE CACHE CHANGE
S77
INDIVIDUAL CONTROL IS REQUIRED?
NO
YES
SERVICE-INDEPENDENT UNIT
SEARCHING INDIVIDUAL CONTROL TABLE
S78
S75
PROCESS SPECIFIC TO MOBILE IP
S79
PACKET EDITING/ROUTING
END

FIG. 45

SERVICE PROFILE CACHE			SEARCH INFORMATION	INDIVIDUAL CONTROL TABLE
SPC	INDIVIDUAL NODE SPC (NSPC)	SOURCE SPC (NSPCsrc)		
		SOURCE DEFAULT SP (NDSPsrc)		
		DESTINATION SPC (NSPCdst)	HA SEGMENT ADDRESS	MOBILITY BINDING
		DESTINATION DEFAULT SP (NDSPdst)	ALL	ROUTING TABLE
		DEFAULT SP (NDSP)	ALL	ROUTING TABLE
	AAA-NOTIFIED SPC (ASPC)	SOURCE SPC (ASPCsrc)		
		DESTINATION SPC (ASPCdst)		

FIG. 46

FURTHER SPECIFIED

SERVICE PROFILE CACHE			SEARCH INFORMATION	INDIVIDUAL CONTROL TABLE
SPC	INDIVIDUAL NODE (NSPC)	SOURCE SPC (NSPCsrc)		
		SOURCE DEFAULT SP (NDSPsrc)		
		DESTINATION SPC (NSPCdst)	CARE-OF ADDRESS (DECAPSULATION AT THE TIME OF HIT)	SERVICE PROFILE CACHE
		DESTINATION DEFAULT SP (NDSPdst)	ALL	VISITOR LIST
		DEFAULT SP (NDSP)	ALL	ROUTING TABLE
	AAA-NOTIFIED SPC (ASPC)	SOURCE SPC (ASPCsrc)		
		DESTINATION SPC (ASPCdst)		

FIG. 47

EP 0 847 220 A2

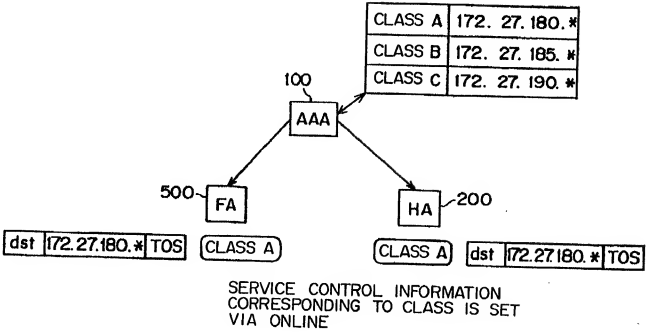


FIG. 48

TOKEN-2020-0

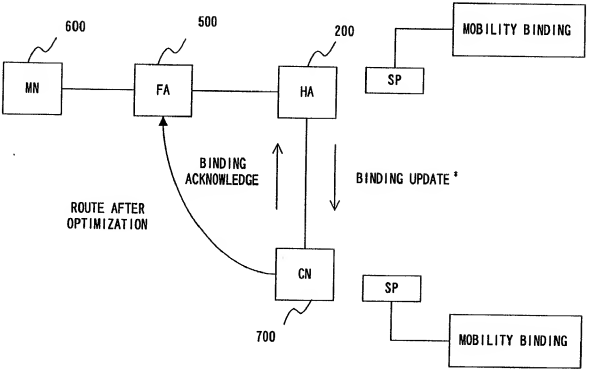


FIG. 49

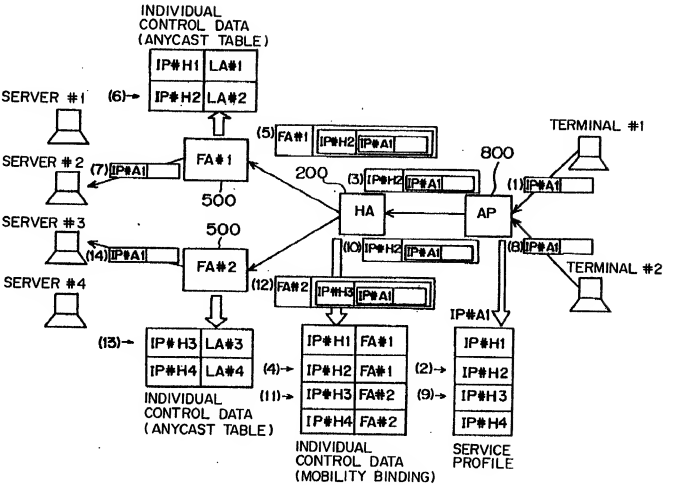

INDIVIDUAL CONTROL DATA (ANYCAST TABLE)
IP#H1 LA#1
IP#H2 LA#2
SERVER #1
SERVER #2
SERVER #3
SERVER #4
(6)
FA#1
500
(7) IP#A1
(5) FA#1 IP#H2 IP#A1
200
(3) IP#H2 IP#A1
HA
AP
800
TERMINAL #1
(1) IP#A1
(8) IP#A1
TERMINAL #2
(10) IP#H2 IP#A1
FA#2
500
(14) IP#A1
(12) FA#2 IP#H3 IP#A1
(13)
IP#H3 LA#3
IP#H4 LA#4
INDIVIDUAL CONTROL DATA (ANYCAST TABLE)
(4)
(11)
IP#H1 FA#1
IP#H2 FA#1
IP#H3 FA#2
IP#H4 FA#2
INDIVIDUAL CONTROL DATA (MOBILITY BINDING)
IP#A1
(2)
(9)
IP#H1
IP#H2
IP#H3
IP#H4
SERVICE PROFILE

FIG. 50

CONSTITUENT ELEMENT	DETAILED CONFIGURATION INFORMATION	SET VALUE
TARGET PACKET CONTROL INFORMATION	SOURCE ADDRESS	*
	SOURCE PORT NUMBER	*
	DESTINATION ADDRESS	ANYCAST ADDRESS
	DESTINATION PORT NUMBER	*
ROUTING/PACKET EDITING INFORMATION	ENCAPSULATION (ENCRYPTION) METHOD	I P in I P
	TRANSFER DESTINATION ADDRESS (MULTIPLE ADDRESSES SPECIFIABLE)	HOME ADDRESS 1 OF MN HOME ADDRESS 2 OF MN
	TOS	SPECIFIED WHEN Diff-Serv IS ALSO USED
	DECAPSULATION INSTRUCTION	NOT GIVEN
INDIVIDUAL CONTROL INFORMATION	NEXT SERVICE CONTROL TYPE	*

FIG. 51

CONSTITUENT ELEMENT	DETAILED CONFIGURATION INFORMATION	SET VALUE
TARGET PACKET CONTROL INFORMATION	SOURCE ADDRESS	*
	SOURCE PORT NUMBER	*
	DESTINATION ADDRESS	HOME ADDRESS OF MN
	DESTINATION PORT NUMBER	*
ROUTING/PACKET EDITING INFORMATION	ENCAPSULATION (ENCRYPTION) METHOD	*
	TRANSFER DESTINATION ADDRESS (MULTIPLE ADDRESSES SPECIFIABLE)	*
	TOS	SPECIFIED WHEN Diff-Serv IS ALSO USED
	DECAPSULATION INSTRUCTION	NOT GIVEN
INDIVIDUAL CONTROL INFORMATION	NEXT SERVICE CONTROL TYPE	MOBILITY BINDING

FIG. 52

EDITED SPECIFIC

CONSTITUENT ELEMENT	DETAILED CONFIGURATION INFORMATION	SET VALUE
TARGET PACKET CONTROL INFORMATION	SOURCE ADDRESS	*
	SOURCE PORT NUMBER	*
	DESTINATION ADDRESS	HOME ADDRESS OF MN
	DESTINATION PORT NUMBER	*
ROUTING/PACKET EDITING INFORMATION	ENCAPSULATION (ENCRYPTION) METHOD	*
	TRANSFER DESTINATION ADDRESS (MULTIPLE ADDRESSES SPECIFIABLE)	*
	TOS	*
	DECAPSULATION INSTRUCTION	NOT GIVEN
INDIVIDUAL CONTROL INFORMATION	NEXT SERVICE CONTROL TYPE	ANYCAST

FIG. 53

EDITED VERSION

CONSTITUENT ELEMENT	DETAILED CONFIGURATION INFORMATION	SET VALUE
TARGET PACKET CONTROL INFORMATION	SOURCE ADDRESS	*
	SOURCE PORT NUMBER	*
	DESTINATION ADDRESS	CARE-OF ADDRESS OF FA ITSELF
	DESTINATION PORT NUMBER	*
ROUTING/PACKET EDITING INFORMATION	ENCAPSULATION (ENCRYPTION) METHOD	*
	TRANSFER DESTINATION ADDRESS (MULTIPLE ADDRESSES SPECIFIABLE)	*
	TOS	*
	DECAPSULATION INSTRUCTION	GIVEN
INDIVIDUAL CONTROL INFORMATION	NEXT SERVICE CONTROL TYPE	SERVICE CACHE

FIG. 54

CONSTITUENT ELEMENT	DETAILED CONFIGURATION INFORMATION	SET VALUE
TARGET PACKET CONTROL INFORMATION	SOURCE ADDRESS	*
	SOURCE PORT NUMBER	*
	DESTINATION ADDRESS	HOME ADDRESS OF MN
	DESTINATION PORT NUMBER	*
ROUTING/PACKET EDITING INFORMATION	ENCAPSULATION (ENCRYPTION) METHOD	*
	TRANSFER DESTINATION ADDRESS (MULTIPLE ADDRESSES SPECIFIABLE)	*
	TOS	*
	DECAPSULATION INSTRUCTION	NOT GIVEN
INDIVIDUAL CONTROL INFORMATION	NEXT SERVICE CONTROL TYPE	VISITOR LIST

FIG. 55

PUBLISHED SPECIFICATION

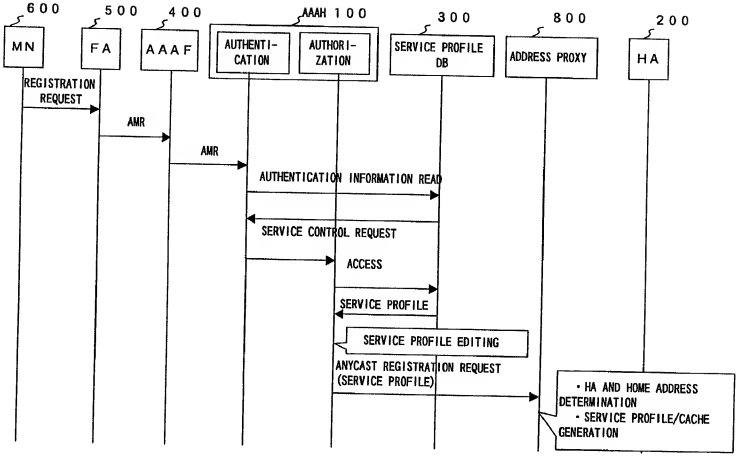


FIG. 56

PRIOR ART

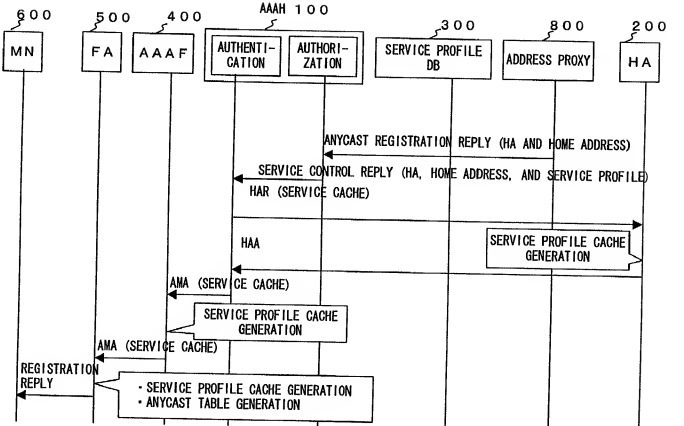


FIG. 57

FOREIGN SERVICE

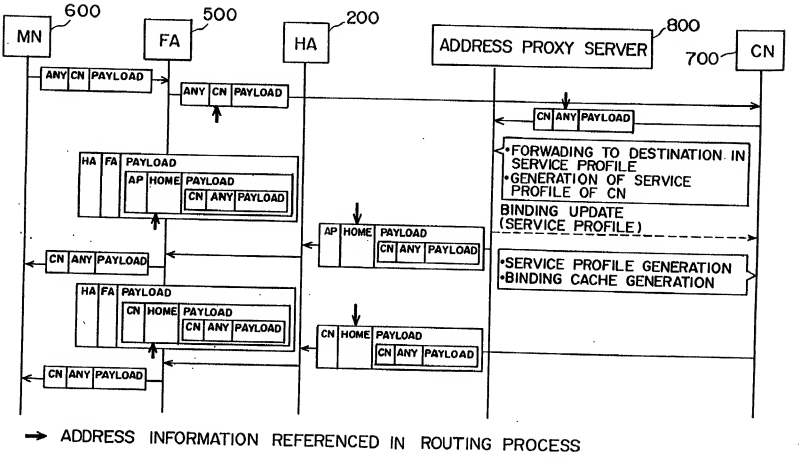


FIG. 58

PATENT APPLICATION

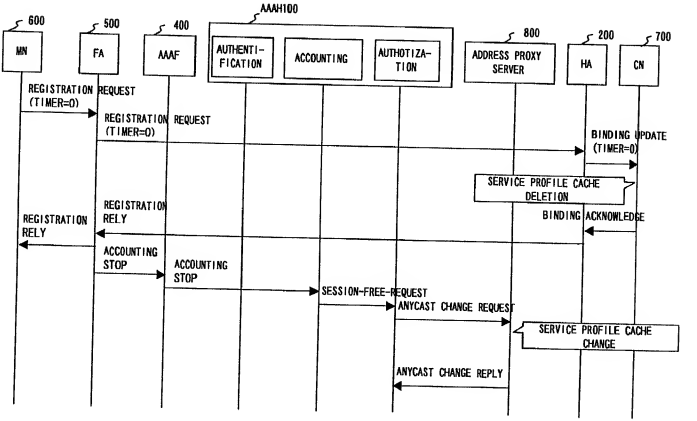


FIG. 59

PUBLISHED BEFORE

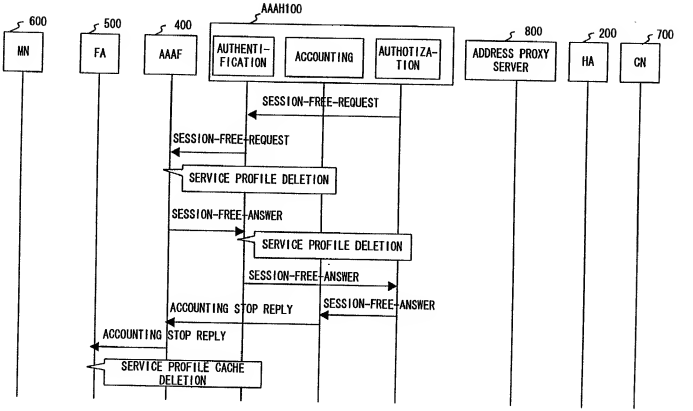


FIG. 60

[MOBILE-IP MESSAGE]

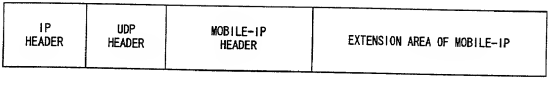


FIG. 61

FIG. 62A

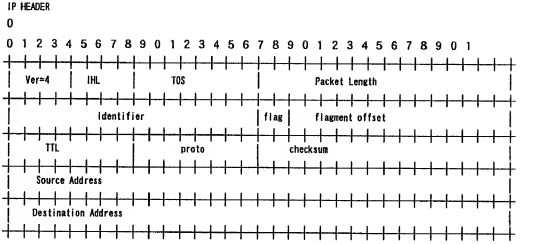


FIG. 62B

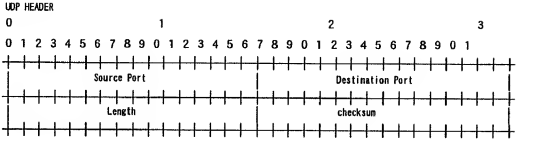


FIG. 63A

BETWEEN MOBILE NODE AND FOREIGN AGENT (CONFIGURATION OF Mobile-IP REGISTRATION REQUEST MESSAGE)

〈 Registration Request 〉
〈 Mobile Node NAI Extension 〉
〈 Previous Foreign Agent Notification Extension 〉

FIG. 63B

Registration Request FORMAT

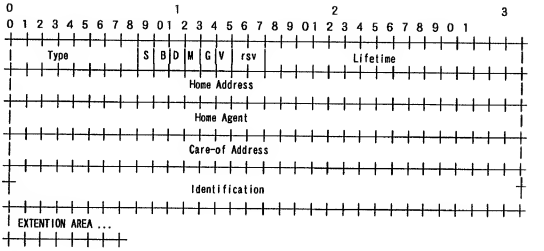


FIG. 63C

EXTENTION AREA NO.1 (Mobile Node NAI Extension)

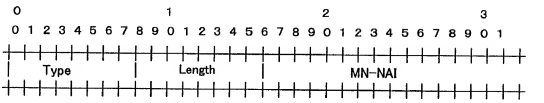


FIG. 63D

EXTENTION AREA NO.2 (Previous Foreign Agent Notification Extension)

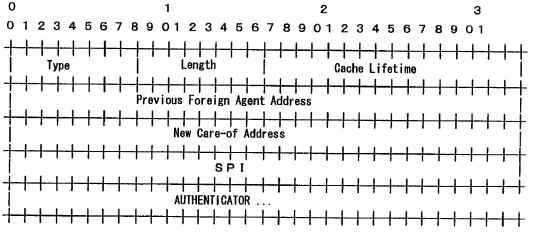


FIG. 64A

BETWEEN MOBILE NODE AND FOREIGN AGENT (CONFIGURATION OF Mobile-IP REGISTRATION REQUEST MESSAGE)

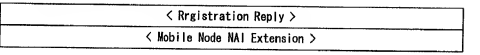
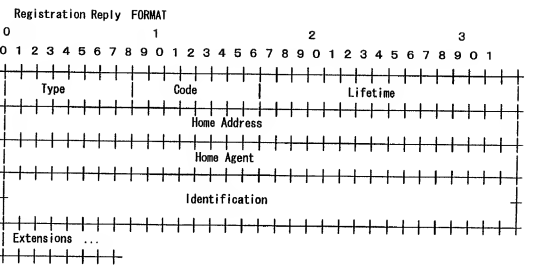


FIG. 64B



Binding Update FORMAT

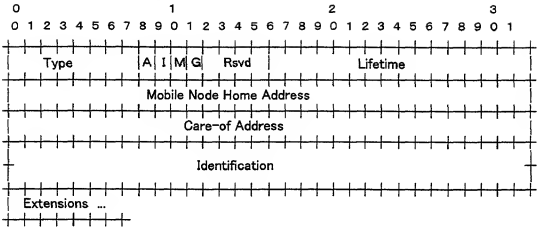


FIG. 65

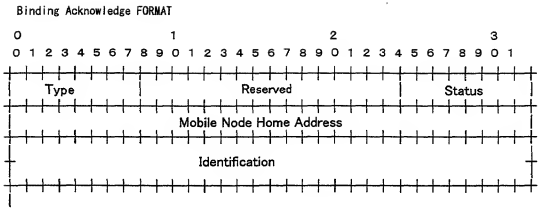

Binding Acknowledge FORMAT
0 1 2 3
0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1
Type
Reserved
Status
Mobile Node Home Address
Identification

FIG. 66

[DIAMETER MESSAGE]

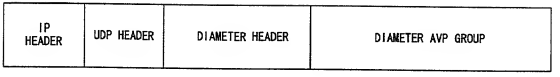
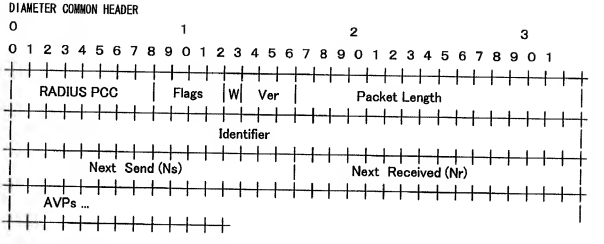


FIG. 67

EARLIER SPECIFICATION



RADIUS PCC: 254 DIAMETER packet
Identifier : IDENTIFIER FOR UNIQUELY MAKING CORRESPONDENCE BETWEEN Registration Request AND Registration Reply

FIG. 68

FIG. 69A

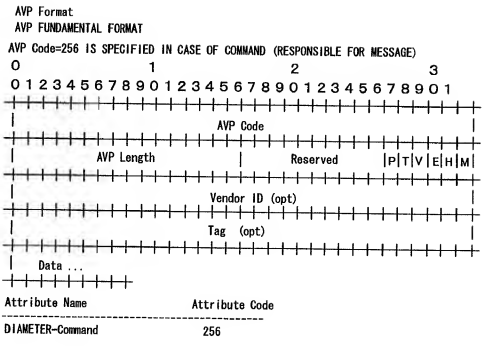

AVP Format
AVP FUNDAMENTAL FORMAT
AVP Code=256 IS SPECIFIED IN CASE OF COMMAND (RESPONSIBLE FOR MESSAGE)
0 1 2 3
0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1
AVP Code
AVP Length
Reserved
P T V E H M
Vendor ID (opt)
Tag (opt)
Data ...
Attribute Name
Attribute Code
DIAMETER-Command
256

FIG. 69B

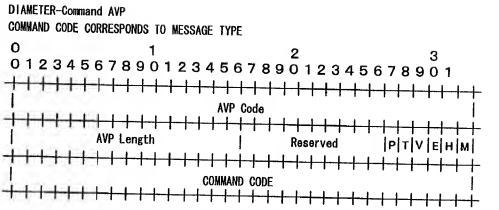
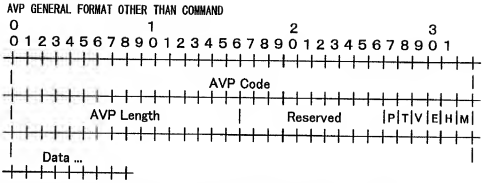

DIAMETER-Command AVP
COMMAND CODE CORRESPONDS TO MESSAGE TYPE
0 1 2 3
0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1
AVP Code
AVP Length
Reserved
P T V E H M
COMMAND CODE

FIG. 69C



AVP FORMAT OTHER THAN DIAMETER COMMAND REFERENCES FOLLOWING IETF DRAFTS
draft-calhoun-diameter-07.txt
draft-calhoun-diameter-mobileip-01.txt

BETWEEN FOREIGN AGENT AND AAAH SERVER

< DIAMETER Header >
< AA-Mobile-Node-Request Command AVP >
< SESSION ID AVP >
< User-Name AVP >
< MIP-Registration-Request AVP >
< MN-FA-Challenge AVP >
< MN-FA-Response AVP >
< Mobile-Node-Address AVP >
< Home-Agent-Address AVP >
< Previous-FA-NAI AVP >
< MN-FA-SPI AVP >
< Timestamp AVP >
< Initialization-Vector AVP >
< Integrity-Check-Vector AVPN > OR < Digital-Signature AVP >

FIG. 70

BETWEEN AAAH SERVER AND HOME AGENT

< DIAMETER Header >
< Home-Aagent-MIP-Request Command AVP >
< SESSION Id AVP >
< User-Name AVP >
< MIP-Registration-Request AVP >
< MN-HA-SPI AVP >
< HA-to-MN-Key AVP >
< MN-to-HA-Key AVP >
< FA-HA-SPI AVP >
< HA-to-FA-Key AVP >
< MN-FA-SPI AVP >
< MN-to-FA-Key AVP >
< Home-Agent-Address AVP >
< Mobile-Node-Address AVP >
< Session-Timeout AVP >
< Timestamp AVP >
< Initialization-Vector AVP >
< Integrity-Check-Vector AVP > OR < Digital-Signature AVP >

FIG. 71

BETWEEN FOREIGN AGENT AND AAAH SERVER

< DIAMETER Header >
< AA-Mobile-Node-Answer Command AVP >
< SESSION Id AVP >
< Result-Code AVP >
[< Error-Code AVP >]
< MIP-Registration-Reply AVP >
< MN-FA-SPI AVP >
< FA-to-MN-Key AVP >
< FA-HA-SPI AVP >
< FA-to-HA-Key AVP >
< Home-Agent-Address AVP >
< Mobile-Node-Address AVP >
< Session-Timeout AVP >
< Timestamp AVP >
< Initialization-Vector AVP >
[< Integrity-Check-Vector AVP > OR < Digital-Signature AVP >]

FIG. 72

BETWEEN AAAH SERVER AND HOME AGENT

< DIAMETER Header >
< Home-Agent-MIP-Answer Command AVP >
< SESSION Id AVP >
< Result-Code AVP >
[< Error-Code AVP >]
< MIP-Registration-Reply AVP >
< Mobile-Node-Address AVP >
< Home-Agent-Address AVP >
< Timestamp AVP >
< Initialization-Vector AVP >
[< Integrity-Check-Vector AVP > OR < Digital-Signature AVP >]

FIG. 73